



Billing Code 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Government-Owned Inventions; Availability for Licensing

AGENCY: National Institutes of Health, HHS.

ACTION: Notice.

SUMMARY: The invention listed below is owned by an agency of the U.S.

Government and is available for licensing to achieve expeditious commercialization of results of federally-funded research and development. Foreign patent applications are filed on selected inventions to extend market coverage for companies and may also be available for licensing.

FOR FURTHER INFORMATION CONTACT:

Barry Buchbinder, Ph.D., 240-627-3678; barry.buchbinder@nih.gov. Licensing information and copies of the U.S. patent application listed below may be obtained by communicating with the indicated licensing contact at the Technology Transfer and Intellectual Property Office, National Institute of Allergy and Infectious Diseases, 5601 Fishers Lane, Rockville, MD, 20852; tel. 301-496-2644. A signed Confidential Disclosure Agreement will be required to receive copies of unpublished patent applications.

SUPPLEMENTARY INFORMATION: Technology description follows.

Recombinant HIV-1 Envelope Proteins and Their Use.

Description of Technology:

An effective human immunodeficiency virus type 1 (HIV-1) vaccine has long been sought to contend with the Acquired Immunodeficiency Syndrome (AIDS) pandemic.

One approach researchers have taken to elicit broadly neutralizing antibodies against HIV-1 is to stabilize the structurally flexible HIV-1 envelope (Env) trimer. Researchers stabilized the Env trimer in a conformation that displays predominantly broadly neutralizing epitopes and few non-neutralizing epitopes. Currently, BG505 DS-SOSIP is a leading vaccine candidate with the desired conformation and antigenicity.

Ideally, to be useful as a vaccine, such a conformationally fixed Env immunogen should have high thermostability and should remain in the desired antigenic state, even in the presence of CD4, a glycoprotein found on the surface of immune cells.

Researchers at the Vaccine Research Center (VRC) of the National Institute of Allergy and Infectious Diseases (NIAID) undertook efforts to improve the properties of BG505 DS-SOSIP for use as a vaccine. The VRC researchers introduced three additional mutations to further stabilize BG505 DS-SOSIP in the vaccine-preferred prefusion-closed conformation and refer to the engineered BG505 DS-SOSIP as BG505 DS-SOSIP.3mut. Experiments showed that these modifications conferred improved thermostability that will allow easier transport and storage of BG505 DS-SOSIP.3mut compared to BG505 DS-SOSIP. In addition, BG505 DS-SOSIP.3mut has lower antigenicity toward non/weak neutralizing antibodies compared to BG505 DS-SOSIP, which suggests that it could

potentially elicit higher neutralization titer by targeting only broadly neutralizing antibodies. With improved antigenicity and stability, this version may have utility as an HIV-1 immunogen or in other antigen-specific contexts, such as for use with B-cell probes.

This technology is available for licensing for commercial development in accordance with 35 U.S.C. § 209 and 37 CFR Part 404.

Potential Commercial Applications:

- Vaccine - to elicit potent neutralizing antibodies against the HIV-1 Env glycoprotein
- Probes - to identify broad and potent HIV-1-neutralizing antibodies

Competitive Advantages:

Compared to previous engineered Env trimer versions:

- 300- fold reduction in CD4-binding affinity.
- Reduced binding affinity to ineffective HIV-1 antibodies.
- Increase in melting temperature (10 degrees over BG505 SOSIP).

Development Stage: *In vivo* testing (rodents).

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Intellectual Property: HHS Reference Number E-240-2017 includes U.S. Provisional Patent Application Number 62/579,973 filed 10/16/2017.

Related Intellectual Property: HHS Reference Number E-187-2014 includes U.S.

Provisional Patent Application Number 62/046,059 filed 9/4/2014, U.S. Provisional

Patent Application Number 62/136,480 filed 3/21/2015, PCT Application No.

PCT/US2015/048729 filed 9/4/2015, US Patent Application 15/508,885 filed 3/3/2017,

EP Patent Application Number 15766697.5 filed 3/29/2017.

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